PATENT CLAIMS

1. Device for IR-spectrometric analysis of a solid, liquid or gaseous medium, comprising a process probe (2), which has a reflection element (15), and further comprising a linear variable filter (6), at least one detector element (8) and a control/evaluation unit (10),
wherein at least one radiation source (5) is provided, whose electromagnetic radiation is coupled into the reflection element (15),
wherein at least one waveguide (3) is provided, having an input section (11) and an output section (12),
wherein the electromagnetic radiation is conducted via the output section (12) of the waveguide (3) into at least one defined area of the linear variable filter (6),
wherein the detector element (8) and the linear variable filter (7) are arranged movably relative to one another over essentially the length of the linear variable filter (7), and
wherein the control/evaluation unit (10) determines the spectrum of the medium on the basis of the measured values delivered from the detector element (8).

2. Device for IR-spectrometric analysis of a solid, liquid or gaseous medium, comprising a process probe (2), which has a reflection element (15), further comprising a linear variable filter (6), at least one detector element (8) and a control/evaluation unit (10),
wherein at least one radiation source (5) is provided, whose electromagnetic radiation is focused into at least one defined region of the linear variable filter (7),
wherein at least one waveguide (4) is provided, via which the electromagnetic radiation is coupled, after passing through the linear variable filter (6), into the reflection element (15),
wherein the focused electromagnetic radiation coming from the radiation source (5) and the linear variable filter (7) are arranged movably relative to one another over essentially the length of the linear variable filter (7),
wherein the detector element (8) receives the electromagnetic radiation after it has passed through the reflection element (15), and
wherein the control/evaluation unit (10) determines the spectrum of the medium on the

basis of the measurement values delivered from the detector element (8).

3. Device as claimed in claim 1 or 2,
wherein the control/evaluation unit (10) controls the relative movement between the detector element (8) and the linear variable filter (7), respectively between the radiation source (5) and the linear variable filter (7), stepwise or continuously.

4. Device as claimed in claim 1 or 2,
wherein the detector element (8) is mounted fixedly and
wherein the control/evaluation unit (10) moves the linear variable filter (7) stepwise past the detector element (8), or, as the case may be,
wherein the radiation source (5) is mounted fixedly and
wherein the control/evaluation unit (10) moves the linear variable filter (7) stepwise or continuously past the detector element (8).

5. Device as claimed in claim 1 or 2,
wherein the linear variable filter (7) is mounted fixedly and
wherein the control/evaluation unit (10) moves the detector element (8) stepwise past the linear variable filter (7), or, as the case may be,
wherein the linear variable filter (7) is fixedly mounted and wherein the control/evaluation unit (10) moves the linear variable filter (7) stepwise or continuously past the radiation source (5).

6. Device as claimed in claim 1 or 2,
wherein a holding device (26) is provided, in which the detector element (8) and the light output section (12), respectively the radiation source (5) and the light input section or the linear variable filter (7) are/is mounted.

7. Device as claimed in claim 6,
wherein the holding device (26), respectively the detector element (8), respectively the radiation source (5) or the linear variable filter (7) are arranged on a guide rail (6).

8. Device as claimed in claim 1 or 7,
wherein the output section (12) and/or the input section includes a cross-section converter (22).

9. Device as claimed in claim 3, 4, 5 or 6,
wherein a drive (9) is provided for moving the linear variable filter (7) or the detector element (8), respectively the radiation source (5), respectively the holding device (26) for the detector element (8), respectively the radiation source (5), stepwise or continuously.

10. Device as claimed in claim 1,
wherein the first optical waveguide (3) is an optical fiber duplexer (32), via which the measuring radiation and a reference radiation are guided to the reflection element (15) and wherein the measuring beam and the reference beam are conducted to the linear variable filter (7).

11. Device as claimed in claim 1,
wherein the detector element (8) comprises a pyroelectric detector, preferably a thermopile or an MCT detector, or the detector element (8) comprises a detector array.

12. Device as claimed in claim 1 or 2,
wherein the reflector element (15) is manufactured from a high-purity semiconductor material.

13. Device as claimed in claim 1 or 2,
wherein the reflector element (15) is manufactured from a high-purity semiconductor material or another IR-transmittive material, on which a thin diamond coating (21) is applied.

15. Device as claimed in claim 1 or 2,
wherein the reflection element (15) comprises a microprism (48), which is preferably manufactured from diamond.

16. Device as claimed in one or more of the preceding claims, wherein the reflector element (15) is so dimensioned and embodied that the ray path (18) of the measuring light, respectively reference light, undergoes a plurality of reflections in the reflection element (15), wherein the number of reflections is determinable via the length of the reflection element (15).

17. Device as claimed in claim 15 or 16,
wherein the reflection element (15) has a round, quadratic or polygonal cross sectional area.

18. Device as claimed in claim 17,
wherein the first wave guide (3) comprises a plurality of fibers (40; 41) and has on the side of the linear variable filter (7) a preferably linear fiber cross-section converter (37) and on the side of the reflection element (15) a preferably L-shaped cross-section converter (39),
wherein the second wave guide (4) comprises a plurality of fibers (41; 40) and has on the side of the reflection element (15) a preferably L-shaped fiber cross-section converter (39) and on the side of the detector (8) a preferably quadratic fiber cross-section converter (38).

19. Device as claimed in claim 18,
wherein the two fiber cross-section converters (39) are integrated on the side of the reflection element (15), respectively the microprism (48), into at least one holder (43, 44) respectively into at least one plug, and are arranged in the immediate vicinity of the cross-sectional area of the reflection element (15; 48), respectively sit on the cross-sectional area of the reflection element (15; 48)

20. Device as claimed in claim 1 or 2,
wherein the process probe (2) comprises an ATR probe, a reflection probe or a transmission probe.